Trend Study 2-29-01

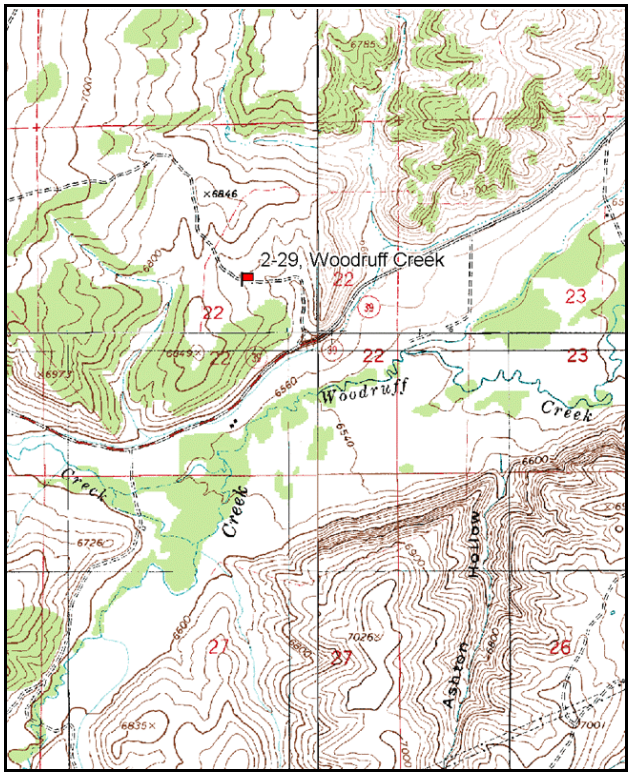
Study site name: Woodruff Creek . Vegetation type: Big Sagebrush .

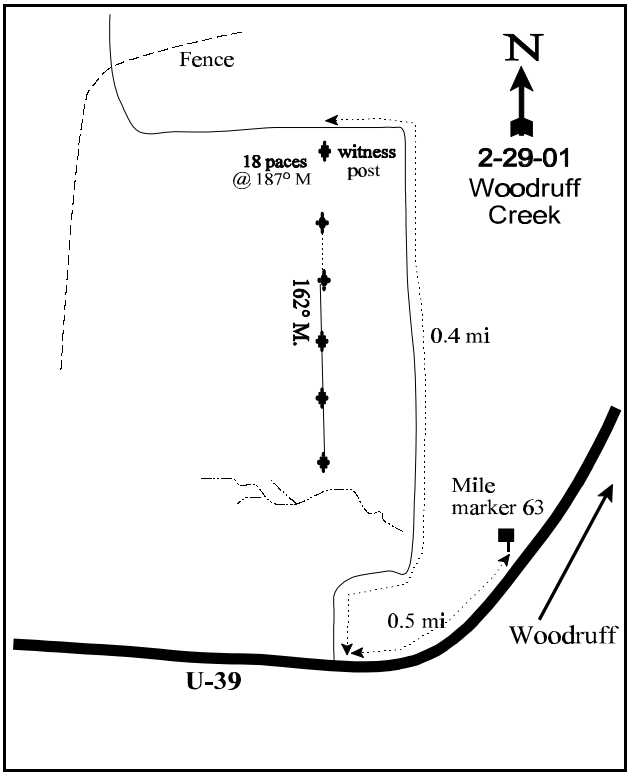
Compass bearing: frequency baseline 162 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the junction of U-39 and U-16 in Woodruff, proceed west on U-39 for 5.05 miles, and turn right onto a dirt road. This road should be 0.05 miles past marker 63. Proceed north on this road stopping after 0.4 miles at a witness post on the left (south). From the witness post, walk 18 paces at 187 degrees magnetic to the 0-foot stake of the baseline marked by browse tag #7989.





Map Name: Birch Creek Reservoirs Diagrammatic Sketch

Township 9N , Range 6E , Section 22 UTM 4594285 N, 478796 E

DISCUSSION

Trend Study No. 2-29

The Woodruff Creek trend study samples critical winter range which supports a scattered juniper-pinyon woodland of about 200 trees/acre. Wyoming big sagebrush with a fair herbaceous association is also intermixed. The site is located north of Woodruff Creek on gentle, rolling terrain at approximately 6,720 feet in elevation. The area sustains heavy use from deer and livestock. Wildlife use may have intensified in recent years because surrounding habitat has been chained and seeded to provide livestock forage. Design of the chaining project has resulted in extremely large open areas that are devoid of cover, producing minimum "edge" and little browse. Wildlife habitat needs were obviously not a consideration. Quadrat frequency of deer pellet groups was moderately high at 38% in 1996 and 42% in 2001. Elk pellet groups were also encountered but in small numbers. Rabbit pellet groups were also fairly common. Some cattle pats were seen in the area in 1996, but none were encountered within the quadrats. More occur in the chained areas. A pellet group transect read along the study site baseline in 2001 estimated 103 deer days use/acre (255 ddu/ha). About 3/4 of the deer pellet groups encountered appeared to be from late winter/early spring use with the other 1/4 being more recent and likely from a few resident deer. Cattle use was estimated at 2 cow days use/acre (5 cdu/ha).

Soil is moderately shallow with an effective rooting depth (see methods) estimated at 12 inches. Soil texture is a clay loam with some gravel in the profile and pavement concentrated on the surface. Rock and pavement combined for an estimated 11% cover in 1996 and 2001. Soil on the site has a neutral soil reaction (7.3 pH). Chemical analysis of the soil indicates a low level of phosphorus (6.2 ppm), which could be a limiting factor to the site as values less than 10 ppm may limit plant growth and development. Protective ground cover is poor leaving large unprotected interspaces. Soil pedestalling is evident and sheet erosion is occurring, yet no large gullies have formed on the site due to the gentle terrain. The soil condition class was determined to be slight in 2001.

Available browse forage comes primarily from Wyoming big sagebrush which accounted for 35% of the shrub cover in 2001. The moderately dense stand had an estimated density of 6,465 plants/acre in 1984. Utilization was heavy at that time (>60% of twigs browsed) on 78% of the shrubs and 57% were classified as decadent. The population remained stable in 1990 with moderate to heavy use, poor vigor on one-third of the population, and percent decadence remained high at 58%. Reproduction was poor with 57% (1,666 plants/acre) of the decadent sagebrush sampled classified as dying (>50% crown death). During the 1996 reading, the baseline was lengthened to greatly increase the area sampled. The longer baseline extends into a more dense stand of juniper trees than the original 100 foot baseline, therefore density estimates for 1996 may be lower. Juniper canopy cover is variable on the site and ranged from 2% to as high as 43% in 1996. Average canopy cover was 14% in 1996 and 10% in 2001. Wyoming big sagebrush density was estimated at 2,260 plants/acre in 1996. Mature plants were somewhat stunted and measured only 16 inches in height. Utilization was light to moderate with 11% of the plants displaying heavy use. Even with the change in sample size, the population has obviously declined since 1990 due to the large number of dead plants (1,260 plants/acre) sampled in 1996. Dead plants were not previously sampled. Percent decadence declined slightly to 41% in 1996, but half of those shrubs were classified as dying. Reproduction continued to be poor. No young plants and few seedlings were encountered. The population remained stable in 2001 at 2,540 plants/acre. Utilization was classified mostly as moderate. Vigor improved but percent decadence has increased from 41% to 57%. Reproduction improved with more seedlings and young being sampled.

Other browse species found on the site include serviceberry, stickyleaf low rabbitbrush, snowberry, and gray horsebrush. All occur in small numbers except rabbitbrush which accounts for about one-third of the browse cover and has a density of nearly 5,000 plants/acre. The population is mostly mature.

The herbaceous understory is diverse, yet not particularly abundant. Seven perennial and one annual grass combined to produce about 10% cover in 1996 and 11% in 2001. The most common species include thickspike, mutton and Sandberg bluegrass. The accompanying data summary is indicative of forb diversity on this site. The number of species considerably exceeds that normally encountered on juniper-pinyon sites. However, in spite of the apparent diversity, forage production and cover from forbs is quite low. Even annual forbs are of no significance on this site.

1984 APPARENT TREND ASSESSMENT

Soil trend appears to be declining. Almost every trend parameter suggests that erosion losses far exceed the rate of soil formation. Vegetative trends are more difficult to assess. Our best estimate is that Wyoming big sagebrush is slowly declining in density due to excessive use and inadequate reproduction. At the same time, the Utah juniper overstory may be expanding. The herbaceous understory is a remarkably good one for this range type, but still likely to decline if the juniper canopy increases.

1990 TREND ASSESSMENT

The soil trend is stable but in poor condition. Percent bare ground has declined due primarily to an increase in pavement and cryptogamic cover. Percent basal vegetation cover increased while litter cover declined. The Wyoming big sagebrush stand on the Woodruff Creek study site has remained stable in density since 1984. However, the relatively small shrubs display heavy hedging and poor vigor. There is an overly high percentage (58%) of decadent plants. However, this is not much different than 1984 when percent decadence was 57%. The density of juniper has not increased since 1984. The point-centered quarter method estimate is 182 juniper/acre, mostly young trees. There have been some changes in composition of the herbaceous understory, but sum of nested frequency and diversity remain high for the type of site. Sum of nested frequency for perennial grasses increased, while frequency of perennial forbs declined. Overall trend is considered stable.

TREND ASSESSMENT
soil - stable but in poor condition (3)
browse - stable but in poor condition (3)
herbaceous understory - stable (3)

1996 TREND ASSESSMENT

Trend for soil is slightly down due to an increase in bare ground from 21% to 28%. This increase in bare ground cover comes primarily from a reduction in pavement cover which declined from 22% to 9%, and a decline in cryptogams from 14% to 2%. This would indicate possible recent sedimentation. Trend for the key browse species, Wyoming big sagebrush is down and appears to be in a state of decline. Density has dropped 55% since 1990. Some of the change is due to the much larger sample used in 1996, but dead plants, first sampled in 1996, number 1,260 plants/acre. Due to the lack of adequate reproduction, it is obvious that the population has declined since 1990. Utilization has been heavy in the past, although current use is mostly light to moderate. Vigor is poor on 25% of the shrubs with 41% of the population classified as decadent. Of the plants that were classified as decadent, 50% appear to be dying. Reproduction is poor with only a few seedlings encountered. This downward trend will continue as juniper cover increases. Trend for the herbaceous understory is down slightly due to a decline in the sum of nested frequency for perennial grasses. Sum of nested frequency for perennial forbs remained similar to 1990, but forbs make up only 29% of the herbaceous cover.

TREND ASSESSMENT
soil - down slightly (2)
browse - down (1)
herbaceous understory - slightly down (2)

2001 TREND ASSESSMENT

Trend for soil is stable but in poor condition. Ground cover characteristics are similar to 1996 with erosion still occurring. Trend for Wyoming big sagebrush is stable yet in poor condition. Utilization is mostly moderate with improved vigor. However, percent decadence is still high at 57%. Average vigor of the decadent age class has improved as only 17% are currently classified as dying. Annual leader growth is minimal, averaging only 1 inch in 2001. Reproduction has improved since 1990 and appears to be adequate to maintain the stand. Trend for the herbaceous understory is stable with sum of nested frequency values for perennial grasses and forbs remaining similar to 1996 values.

TREND ASSESSMENT
soil - stable but in poor condition (3)
browse - stable but in poor condition (3)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 02 , Study no: 29

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
G	Agropyron cristatum	$_{a}$-	$_{a}$-	$_{a}$1	$_{b}$12	-	-	1	6	.03	.51
G	Agropyron dasystachyum	$_{b}$195	$_{b}$201	$_{a}$101	$_{a}$142	70	75	39	55	.54	1.97
G	Agropyron spicatum	$_{a}$1	$_{a}$7	$_{b}$24	$_{a}$8	1	4	10	3	.36	.41
G	Bromus tectorum (a)	-	-	11	6	-	-	4	3	.16	.01
G	Oryzopsis hymenoides	$_{a}$1	$_{ab}$20	$_{ab}$11	$_{b}$24	1	8	4	10	.61	1.22
G	Poa fendleriana	$_{a}$46	$_{c}$141	$_{bc}$133	$_{b}$102	20	60	56	37	5.24	4.10
G	Poa pratensis	-	-	1	-	-	-	1	-	.03	-
G	Poa secunda	$_{ab}$123	$_{b}$161	$_{a}$102	$_{ab}$111	56	62	42	40	2.53	2.26
G	Sitanion hystrix	$_{ab}$22	$_{ab}$22	$_{b}$27	$_{a}$9	13	12	15	4	.57	.24
Total for Annual Grasses		0	0	11	6	0	0	4	3	0.16	0.01
Total for Perennial Grasses		388	552	400	408	161	221	168	155	9.94	10.73
Total for Grasses		388	552	411	414	161	221	172	158	10.10	10.75
F	Achillea millefolium	-	-	1	-	-	-	1	-	.00	-
F	Allium acuminatum	$_{b}$14	$_{a}$-	$_{a}$-	$_{a}$-	7	-	-	-	-	-
F	Alyssum alyssoides (a)	-	-	-	1	-	-	-	1	-	.00
F	Antennaria rosea	7	10	3	2	3	5	1	1	.00	.03
F	Arabis holboellii	2	-	4	-	1	-	2	-	.01	-
F	Astragalus beckwithii	$_{b}$13	$_{a}$-	$_{a}$-	$_{a}$3	6	-	-	1	-	.03

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
F	Astragalus convallarius	$_{b}$13	$_{a}$-	$_{b}$12	$_{c}$34	6	-	5	16	.05	.33
F	Asclepias speciosa	$_{a}$-	$_{a}$-	$_{b}$12	$_{a}$-	-	-	5	-	.36	-
F	Astragalus utahensis	$_{b}$18	$_{a}$6	$_{a}$2	$_{ab}$12	11	3	1	5	.00	.12
F	Calochortus nuttallii	1	-	-	-	1	-	-	-	-	-
F	Chaenactis douglasii	$_{b}$34	$_{a}$2	$_{a}$6	$_{a}$7	18	1	3	4	.01	.02
F	Comandra pallida	35	21	23	24	19	8	11	14	.13	.17
F	Cordylanthus ramosus (a)	-	-	12	20	-	-	8	9	.07	.09
F	Crepis acuminata	3	-	4	3	2	-	1	1	.00	.03
F	Cryptantha spp.	26	22	26	32	16	12	17	13	.46	1.08
F	Cymopterus spp.	$_{a}$-	$_{a}$-	$_{b}$10	$_{a}$-	-	-	5	-	.02	-
F	Descurainia pinnata (a)	-	-	3	-	-	-	1	-	.00	-
F	Erigeron pumilus	$_{b}$11	$_{a}$-	$_{a}$-	$_{a}$2	7	-	-	1	-	.00
F	Eriogonum umbellatum	4	-	5	-	2	-	4	-	.04	-
F	Halogeton glomeratus (a)	-	-	1	-	-	-	1	-	.00	-
F	Ipomopsis aggregata	7	-	4	-	3	-	2	-	.01	-
F	Lithospermum ruderale	3	-	-	4	1	-	-	2	-	.15
F	Microsteris gracilis (a)	-	-	-	4	-	-	-	2	-	.01
F	Penstemon humilis	$_{b}$86	$_{b}$85	$_{a}$46	$_{a}$53	40	43	19	25	.58	.40
F	Phlox hoodii	88	103	80	80	39	42	37	35	1.41	.74
F	Phlox longifolia	62	48	33	58	26	19	16	25	.08	.15
F	Ranunculus testiculatus (a)	-	-	1	-	-	-	1	-	.00	-
F	Senecio multilobatus	$_{b}$61	$_{a}$10	$_{b}$75	$_{a}$20	29	6	31	10	.89	.07
Total for Annual Forbs		0	0	17	25	0	0	11	12	0.08	0.11
Total for Perennial Forbs		488	307	346	334	237	139	161	153	4.11	3.37
Total for Forbs		488	307	363	359	237	139	172	165	4.19	3.48

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 02 , Study no: 29

Type	Species	Strip Frequency '96	Strip Frequency '01	Average Cover % '96	Average Cover % '01
B	Artemisia tridentata wyomingensis	60	60	5.53	5.25
B	Chrysothamnus viscidiflorus viscidiflorus	77	74	4.97	4.13
B	Juniperus osteosperma	8	8	4.42	4.32
B	Symphoricarpos oreophilus	3	1	.15	.30
B	Tetradymia canescens	19	18	1.01	.85
Total for Browse		167	161	16.11	14.86

CANOPY COVER --
Herd unit 02 , Study no: 29

Point-Quarter Tree Data

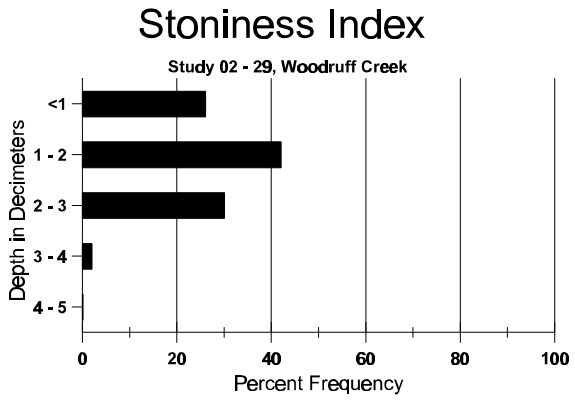
Species	Percent Cover '96	Percent Cover '01	Trees per Acre '96	Trees per Acre '01	Average diameter (in) '96	Average diameter (in) '01
Juniperus osteosperma	14	10	205	218	5.3	7.1

BASIC COVER --
Herd unit 02 , Study no: 29

Cover Type	Nested Frequency '96	Nested Frequency '01	Average Cover % '84	Average Cover % '90	Average Cover % '96	Average Cover % '01
Vegetation	306	315	4.75	7.50	30.55	31.23
Rock	105	40	1.75	2.50	1.46	.78
Pavement	273	265	10.50	21.75	9.37	9.81
Litter	390	367	47.25	33.50	38.38	42.15
Cryptogams	88	117	3.00	13.75	2.05	3.30
Bare Ground	306	289	32.75	21.00	27.75	31.45

SOIL ANALYSIS DATA --
Herd Unit 02, Study no: 29, Woodruff Creek

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
12.2	55.8 (13.7)	7.3	34.6	32.1	33.4	2.5	6.2	25.6	.6



PELLET GROUP FREQUENCY --
Herd unit 02 , Study no: 29

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'96	'01	'01	'01
Rabbit	21	15	104	N/A
Elk	6	2	-	-
Deer	38	42	1340	103 (255)
Cattle	-	-	26	2 (5)

BROWSE CHARACTERISTICS --
Herd unit 02 , Study no: 29

AGE	YR	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Amelanchier utahensis																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	16	24	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	
'90	00%	00%	00%	
'96	00%	00%	00%	
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	0	Dec:	-
	'90	0		-
	'96	0		-
	'01	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	01	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	84	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	90	3	1	-	-	-	-	-	-	-	4	-	-	-	266			4
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	6	-	-	3	-	-	-	-	-	9	-	-	-	180			9
M	84	5	8	24	-	-	-	-	-	-	36	1	-	-	2466	13	16	37
	90	2	16	17	1	2	-	-	-	-	37	-	-	1	2533	19	21	38
	96	37	26	3	1	-	-	-	-	-	61	1	-	5	1340	16	27	67
	01	20	23	1	-	1	1	-	-	-	46	-	-	-	920	16	25	46
D	84	-	3	52	-	-	-	-	-	-	49	-	3	3	3666			55
	90	2	30	23	-	-	-	-	-	-	29	-	-	26	3666			55
	96	17	20	9	-	-	-	-	-	-	23	-	-	23	920			46
	01	23	46	1	-	2	-	-	-	-	60	-	-	12	1440			72
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	1260			63
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	1320			66

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	11%	78%	06%	+ 0%
'90	51%	41%	28%	-65%
'96	41%	11%	25%	+11%
'01	57%	02%	09%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	6465	Dec:	57%
	'90	6465		57%
	'96	2260		41%
	'01	2540		57%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
Y	84	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	90	9	4	-	2	-	-	-	-	-	15	-	-	-	1000			15
	96	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
	01	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	84	36	-	-	-	-	-	-	-	-	36	-	-	-	2400	7	10	36
	90	11	12	-	6	-	-	-	-	-	29	-	-	-	1933	7	12	29
	96	218	-	-	15	-	-	-	-	-	233	-	-	-	4660	9	15	233
	01	209	1	-	-	-	-	-	-	-	208	2	-	-	4200	9	13	210
D	84	7	-	-	-	-	-	-	-	-	6	-	1	-	466			7
	90	2	6	1	-	1	-	-	-	-	10	-	-	-	666			10
	96	4	-	-	-	-	-	-	-	-	2	-	-	2	80			4
	01	22	-	-	-	-	-	-	-	-	15	-	-	7	440			22
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	02%	+17%
'90	43%	02%	00%	+27%
'96	00%	00%	.81%	- 4%
'01	.42%	00%	03%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	2999	Dec:	16%
	'90	3599		19%
	'96	4900		2%
	'01	4720		9%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
S	84	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	84	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	90	2	2	-	-	-	-	-	-	-	4	-	-	-	266			4
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	2	-	-	1	-	-	-	-	-	3	-	-	-	60			3
M	84	1	-	-	-	-	1	-	-	-	2	-	-	-	133	57	22	2
	90	-	-	-	-	-	1	-	-	-	1	-	-	-	66	89	51	1
	96	6	2	-	-	-	-	-	-	-	8	-	-	-	160	-	-	8
	01	3	-	-	-	-	-	-	2	-	3	2	-	-	100	-	-	5
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	25%	00%	+20%
'90	40%	20%	00%	-52%
'96	25%	00%	00%	+ 0%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	266	Dec:	-
	'90	332		-
	'96	160		-
	'01	160		-

Symphoricarpos oreophilus																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	2	-	-	2	-	-	-	-	-	3	-	1	-	80	11	21	4
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20	10	29	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	
'90	00%	00%	00%	
'96	00%	00%	25%	-75%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	0	Dec:	-
	'90	0		-
	'96	80		-
	'01	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Tetradymia canescens																		
M	84	-	1	1	-	-	-	-	-	-	2	-	-	-	133	9	16	2
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	18	2	-	-	-	-	-	-	-	20	-	-	-	400	12	20	20
	01	16	-	-	-	-	-	-	-	-	16	-	-	-	320	12	21	16
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	2	1	-	-	-	-	-	-	3	-	-	-	200			3
	96	2	-	-	-	-	-	-	-	-	1	-	-	1	40			2
	01	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	50%	50%	00%	+34%
'90	67%	33%	00%	+55%
'96	09%	00%	05%	- 9%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	133	Dec:		0%
'90	200			100%
'96	440			9%
'01	400			20%